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4.10 Test of DOE Code Comparison Project, Problem Five, Case A

This test verifies that FEHM has correctly implemented heat and mass transfer and phase partitioning. Figures 45 and 46 show that FEHM results are in good agreement with the other code solutions for the simulation of the DOE Code Comparison Project Problem. The results of the numerical comparison to the other code solutions are given in Table 52. The maximum absolute error in temperature at the production well for this run was less than 2.1°C, the maximum absolute error in pressure at the production well for this run was less than 0.07 MPa, the maximum absolute error in pressure at the observation well for this run was less than 0.04 MPa, and the percent errors were all less than 3%. These results meet the acceptance criteria for this test suite developed in Chapter III.

Table 52. Results of the test of the DOE Code Comparison Project Problem[‡]			
V&V test	Maximum error	Maximum % error	RMS error
Temperature at production node			
Code 1	1.356	0.6531	0.7746e-03
Code 2	1.519	0.6469	0.1070e-02
Code 3	1.623	0.6867	0.1259e-02
Code 4	2.003	0.8526	0.1139e-02
Code 5	1.498	0.7299	0.9932e-03
Code 6	1.368	0.5906	0.1379e-02
Pressure at production node			
Code 1	0.5123e-01	1.581	0.1908e-02
Code 2	0.6127e-01	2.022	0.3137e-02
Code 3	0.5347e-01	1.770	0.3235e-02
Code 4	0.6234e-01	2.057	0.3017e-02
Code 5	0.2150e-01	0.7165	0.1199e-02
Code 6	0.2828e-01	0.9396	0.1637e-02
Pressure at observation node			
Code 1	0.2530e-01	0.7312	0.8879e-03
Code 2	0.2534e-01	0.7610	0.7676e-03
Code 3	0.1656e-01	0.4841	0.8250e-03
Code 4	0.2215e-01	0.6652	0.7065e-03
Code 5	0.3449e-01	1.042	0.1879e-02
Code 6	0.3446e-01	1.041	0.2547e-02
[‡] Modelers Code 1 - Geotrans, Inc. Code 2 - Intercomp Code 3 - Lawrence Berkeley Laboratory (LBL) Code 4 - Systems, Science and Software (S-Cubed) Code 5 - Stanford University Code 6 - University of Auckland, New Zealand			

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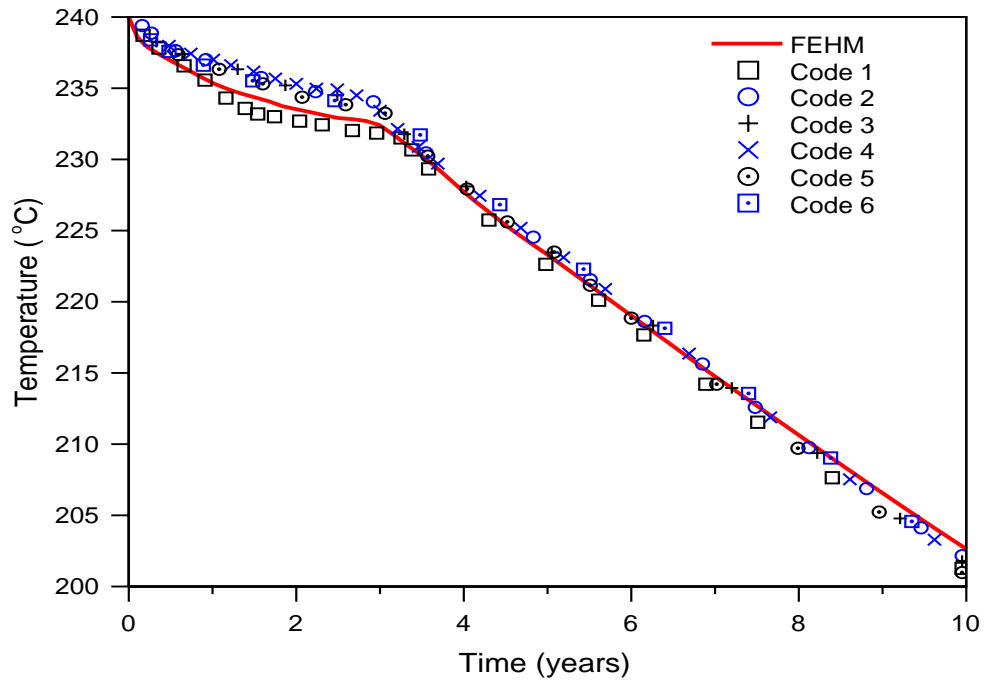


Figure 45. Comparison of FEHM production-well temperatures with results from other codes.

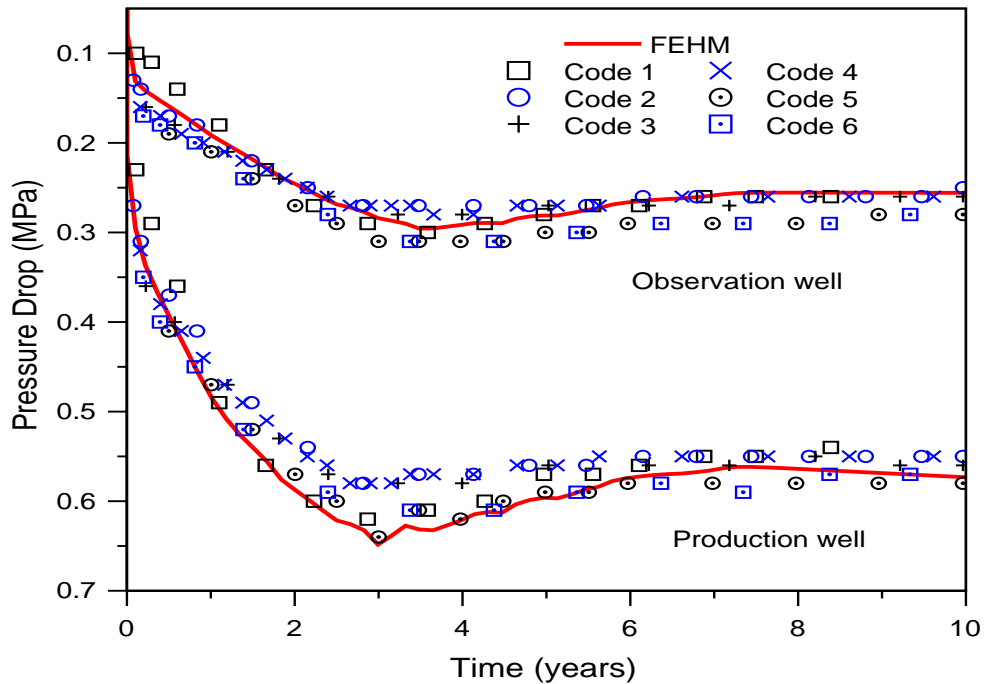


Figure 46. Comparison of FEHM production- and observation-well pressure drops with results from other codes.